nary milk by the addition of either cold or hot water. The addition of the sugar is found to be necessary, in order to enable the other constituents to resist decomposition. Milk will keep any length of time when entirely desiccated, but by the process of drying entirely the milk loses its flavour and many of its properties. The semiliquid condition of condensed milk prevents these changes, but in this state it is liable to decompose; hence the necessity of additional sugar.

The question arises as to whether this added sugar in any way interferes with the quality of the milk in its relation to the diet of infants or invalids. In comparing human milk with cows' milk, we find that the latter contains more caseine and less sugar than the former. Hence, when given to children it is customary to add a little water and a little sugar to make it like mother's milk. This object is really effected by the addition of cane sugar to the condensed milk, and it may therefore be unhesitatingly employed in the nursery as a substitute for ordinary cows' milk.

After a personal inspection of the Aylesbury manufactory, and a full consideration of the whole subject, we are quite prepared to say that where good fresh cows' milk is unattainable, as it is almost practically so in our large towns, there is no substitute for it equal to condensed milk. Nor is this a matter of theory; hundreds of gallons are being used every day in London, and most of it under the direction of experienced medical men. One medical man assures us that he has a healthy, fine-grown child of ten months that has never taken anything but condensed milk.

As the diet of invalids, it may in some cases require watching when the action of sugar is injurious to the system: but in these cases milk should be altogether interdicted.

It is to be hoped that no disadvantage in the use of this agent has been overlooked, as the advantages of its use are so many and so obvious. It presents a pure form of milk in a condition in which it may be kept for any length of time, and is not injured by removal. It is always at hand night and day, and by the addition of cold or hot water can be converted into nutritious and wholesome food. . . . . . . E. LANKESTER

THE PHYSIOLOGY OF MAN

The Physiology of Man. By Austin Flint, Jun., M.D. Pp. 470. (New York: D. Appleton and Co., 1872.)

WE have already had to speak in terms of high commendation of Dr. Flint's comprehensive treatise on human physiology, as being written in a clear, methodical, and judicial style, the statements made being carefully weighed, and in most instances supported, by the best, if not the most numerous, authorities; whilst the author has in many parts enriched it with the results of his own important researches. The present, which constitutes the fourth volume of the work, is no exception to our remarks. It is occupied with the consideration of the nervous system, excluding the special senses, and gives a very complete account of that difficult and extensive section of physiology, the study of which has engaged the attention of so many of the best workers in all civilised countries during the past twenty years. Dr. Flint commences by a short *résumé* of the principal facts that have recently been made out in regard to the structure of the nerve-centres and cords, and the mode of termination of the nerves in muscle, gland, and skin; entering into the subject perhaps as far as is necessary in a strictly physiological work, the author taking Schultze's article in the recently published "Handbook of Histology" of Stricker, Kölliker, and Robin as his guides. The first chapter concludes with an account of the recent observations of Voit on the regeneration of the cerebral hemispheres after their ablation, which show that a large portion of these bodies may be reproduced, and that the organ may recover its functions to no very inconsiderable extent.

The second chapter deals with the general functions of the motor and sensory nerves, and gives a very fair account of the history of the discovery of the difference in the function of the anterior and the posterior roots, due prominence being given to the claims of Walker, Mayo, and especially of Majendie. In speaking of the recurrent sensibility of the anterior roots, Dr. Flint is not satisfied with Brown-Séquard's explanation that it results from the compression of sensory nerves distributed to the muscles during the spasm caused by the irritation of the anterior roots; but inclines to Majendie's and Bernard's opinion that there are actually recurrent sensory nerves in the anterior roots, on the ground that the pain is sometimes apparently severe when the cramps are slight. The relations of the nervous system to electricity, and the rapidity of nerve conduction, with the means of estimating it, are well and correctly given.

The cranial nerves are next considered. In this section we think the author fails in his account of the deep origin of each nerve. He does not appear to have heard of or seen the papers of Lockhart Clarke contained in the Philosophical Transactions (1858-67). Yet these contain by very far the most minute and the most accurate descriptions hitherto published on these points, and the importance of their relations to pathology would have fully justified more elaborate details. Thus, to take one point only, whilst speaking of the deep origin of the sensory root of the fifth pair of nerves, he makes no allusion to the very interesting facts described by Clarke of the internal connection of this root with the vagus and glossopharyngeal nerves in the grey tubercle, or caput cornu posterioris; of the connection of its motor root with the glossopharyngeal nucleus and the fibres of that nerve, and with the fasciculus teres; or, finally, of the connection of the sensory root with the nucleus of the third through the intermediation of the grey tubercle, into which the sensory root penetrates. On the other hand, his account of the functions of the various nerves and their branches is given extremely well; the account of the chorda tympani, for example, being excellent; and the conclusion at which Dr. Flint has arrived, namely, that it is a nerve of gustation, as well as a motor or stimulant nerve for the submaxillary gland, being fully borne out by Lussana's observations recently published in Brown-Séquard's journal, and which, at the time Dr. Flint wrote, had not appeared. A very long section commensurate with its importance is devoted to the pneumogastric nerves, the action of which on the heart, larynx,

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lungs, and stomach is given, with full reference to their remarkable inhibitory and depressing powers.

In the description of the anatomy of the spinal cord, Dr. Flint takes Gerlach's article in Stricker's Handbook as his guide, and gives the following as the results of his own experiments, and those of others which he regards as most reliable. "The gray substance is probably inexcitable and insensible under direct stimulus. The antero-lateral columns are insensible, but are excitable both on the surface and in their substance, *i.e.* direct stimulation will produce convulsive movements in certain muscles, which movements are not reflex and are not attended with pain. The lateral columns are less excitable than the anterior columns. The surface at least of the posterior columns is very sensitive, especially near the posterior roots of the nerves. The deep portions of the posterior columns are probably insensible, except very near the origin of the nerves." Dr. Flint then proceeds to describe the functions of the grey matter, and of the several columns of the white, explaining and adopting the views generally accepted. The posterior white columns he regards, with Todd, as containing fibres acting as commissures between the several segments of the cord.

The functions of the cerebrum are very briefly given, indeed, except in regard to *language* they are not given at all, and for a reason that scarcely appears satisfactory, viz. that though their consideration is properly a part of physiology, the range of the subject is so extensive, that it is only treated of exhaustively in special treatises on mental physiology. This is much to be regretted, as we feel sure that if Dr. Flint had attempted it, he would have succeeded in giving a very interesting section upon it. The cerebellum he regards as the co-ordinator of the muscular movements, and he has collected many pathological cases in support of his view. The last chapters are devoted to the sympathetic nerve and to sleep. The account of the sympathetic system enters freely into the consideration of the vaso-motor and trophic nerves. Upon the whole, this volume of Dr. Flint's work may be regarded as a valuable accession to physiological literature, and as giving the results of modern research with such fulness, combined with accuracy, that the ordinary student will not require to look beyond its pages for any information on this important subject of medical knowledge. We look forward with much interest to the next volume on the "Special Senses," which the author assures us is nearly ready.

CLODD'S "CHILDHOOD OF THE WORLD"

The Childhood of the World: a Simple Account of Man in Early Times. By Edward Clodd, F.R.A.S. (London: Macmillan and Co.)

THIS genial little volume is a child's book as to shortness, cheapness, and simplicity of style, though the author reasonably hopes that older people will use it as a source of information not popularly accessible elsewhere as to the life of Primitive Man and its relation to our own. In brief chapters he states the principal points of the modern science of civilisation, discussing the condition of Præhistoric savages, the early use of stone implements and the introduction of metals, the discovery of other useful arts, the evolution of language, the invention of writing, &c. Having laid down this as a foundation, he then proceeds to his main purpose, that of explaining the successive phases of man's belief, the working of inventive fancy in mythic legend, the rudimentary ideas of the lower races as to souls and their existence in a future state, the nature of deities, and the meaning of the worship offered to them by prayer and sacrifice. Examining the religions of the less cultivated races of the world, he passes through them to arrive at doctrines which, regarding them as highest and surest, he turns all his gift of earnest eloquence to teach. This book, if the time has come for the public to take to it, will have a certain effect in the world. It is not a mere compilation from the authors mentioned in the preface, but takes its own ground and stands by and for itself. Mr. Clodd has thought out his philosophy of life, and used his best skill to bring it into the range of a child's view. Why, indeed, should not children be taught their elementary philosophy of nature at the modern level? Why should they not begin to shape their lives by the best theory of the world, and their own place and duty in it, which their parents can accept? Thoughtful children will take in most of the facts Mr. Clodd works on, and his ideas will open many doors in their minds, leading into regions to be more fully explored years later. Much of the book, it is true, is beyond a child's unhelped understanding; not that the words are too hard, but that the ideas are. Its story is anything but "a tale of little meaning tho' the words be strong;" its simple language has often to convey thoughts too abstract for easy assimilation. Yet there is no harm in this, for the best children's books are those which in part engrave knowledge on their minds with finished accuracy, and in part only stamp roughly impressions which will take their sharper lines another time.

The world is growing daily more alive to the fact that the history of man and man's ideas, with all the problems of belief and duty which can be rightly treated on a historical basis, have been shifted into new places and altered into new forms by the modern sciences of the World and Man. At this present time there are numbers of parents and teachers to whose views such a modern "Religio Medici" as Mr. Clodd offers is congenial, and who distinctly want a book like his to teach out of. The need is all the more felt, because so many of the topics treated are among those where both theology and science put forward claims to speak with authority, while the adjustment of these claims has been mostly attempted by the class of writers who may be called "reconcilers." But educated people now distrust the method of these writers as vitiated by foregone conclusion, and it is more and more felt that the great problems of humanity must be dealt with by men who do not shape their evidence, but let their evidence shape them. Mr. Clodd, at any rate, is no "reconciler." It is evident that his religious feeling has come into real union with his positive knowledge, and that this act of mental chemistry has generated doctrines which are at once his theology and his philosophy. These doctrines it is not the office of this journal to discuss: nor, considering how far Mr. Clodd adopts (of course with due acknowledgment) evidence and theories from the heavier volumes of technical ethno-

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